UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

**MEMORANDUM**

**Date:** **June 26, 2002**

**SUBJECT:** Revised Estimates of the Number of Acres Treated per Day for Lindane Seed Treatment Use on Field Corn

**FROM:** David W. Brassard, Senior Entomologist
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Biological and Economic Analysis Division (7503C)

**THRU:** Arnet Jones, Chief
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**TO:** Mark Howard, Chemical Review Manager
Reregistration Branch III
Special Review and Reregistration Division (7508C)

Peer Review Date: June 26, 2002

## SUMMARY

On June 6, 2002, BEAD met with representatives from the lindane registrants, Gustafson and Uniroyal, to reconcile differences in the assumptions used in the derivation of estimates of the number of field corn acres planted with lindane treated seed per day. BEAD's original assumptions produced estimates of 200 acres treated daily whereas the registrant's assumptions produced estimates of 80 acres treated daily. Based on-farm size information obtained from pesticide usage data and the USDA Agricultural Census, BEAD refuted the registrants' assumption that lindane treated seed is only used on small and medium size farms with 8 row planters. BEAD believes that some growers planting 500 or more acres of corn use 20 row planters to apply lindane treated seed. BEAD agreed with the registrant's assumption of longer hopper refill times (than those experienced by applicators of granular pesticides) for pouring and mixing the seed with a lindane seed treatment product. Based on the revised assumptions provided by the registrant, BEAD is revising its previous estimate of 200 acres of field corn treated with lindane seed treatment per day downward to 180 acres treated per day.

## BACKGROUND

In response to a request from SRRD, BEAD reviewed the "Handler Exposure Assessment for Lindane Use as a Seed Treatment in the United States" submitted by Uniroyal Chemical Company. In a memo dated May 15, 2002, BEAD disagreed with Uniroyal's estimate of 80 acres planted per day for corn (Brassard, 2002). Based on the Science Advisory Council for Exposure Policy Number: 9.1 (Sandvig, 2001), BEAD estimated that 200 acres planted per day was a more reasonable upper end estimate. The EPA policy estimates were based (in part) on an analysis by Brassard and Ng (1993) which assumed the use of 20 row planters for application of granular insecticides and an eight hour work day.

## DIFFERENCES BETWEEN BEAD AND REGISTRANT SEED TREATMENT ASSUMPTIONS

On June 6, 2002, BEAD met with representatives from the lindane registrants, Gustafson and Uniroyal, to discuss the assumptions used in the derivation of these exposure estimates. The registrants indicated that they assumed that on-farm products are typically used by small to medium-sized farm operations who generally use 8 row planters. When queried, the registrants indicated that they had no factual basis for this assumption. BEAD explained that its use information sources indicated that the average field size for lindane treated field corn was 145 acres which is close to the national average of 162 acres (USDA, 1997a). Nationally, 37% of all field corn acreage occurs on, and 7% of all field corn growers harvest, over 500 acres of field corn (Table 1, USDA, 1997b). BEAD believes that many growers planting more than 500 acres of corn would be using 20 row planters.

The registrants also assumed that it would take at least 30 minutes to pour and mix the seed and lindane seed treatment product for an 8 row planter (which is equivalent to about 3.75 minutes per hopper) and that an 8 row planter traveling at 5 miles per hour can treat an acre in about 5 minutes (assuming a 30 inch row spacing) or about 84 acres in an 8 hour day.

8 hours = 480 minutes
30 minutes to refill hoppers x 2 refills = 60 minutes
480 - 60 minutes = 420 minutes planting time remaining in 8 hour day
420 minutes ÷ 5 minutes/acre = 84 acres treated in an 8 hour day

BEAD agrees with the registrant's assumption of longer hopper refill times (than those experienced by applicators of granular pesticides) necessary to pour and mix the seed and lindane seed treatment product. Using the registrant's assumptions regarding refill times, planter speed, and row spacing, BEAD calculated that a grower using a 20 row planter could treat 180 acres in an eight hour day

8 hours = 480 minutes
75 minutes to refill hoppers x 1.5 refills = 112.5 minutes
480 - 112.5 minutes = 367.5 minutes planting time remaining in 8 hour day
a 20 row planter traveling at 5 miles per hour can treat an acre in about 2 minutes

367.5 minutes ÷ 2 minutes/acre = 183.75 acres treated in an 8 hour day

However since 1.5 refills of a 20 row planter only provides enough seed to treat 180 acres[1], BEAD believes that this is a more realistic estimate for exposure assessment purposes. BEAD believes that halving the refill time for the half refill is practical since a full refill requires that 2 bags of seed be added per hopper and treated and thus adding only 1 bag of seed per hopper could be accomplished in roughly half the time.

**CONCLUSION**

BEAD believes that the registrant estimate of 84 acres treated per day represents a reasonable central value exposure scenario. BEAD's estimate of 180 acres treated per day should be considered as reasonable upper end estimate for an 8 hour work day. However, BEAD is aware of situations in which growers working long hours on 24 row planters have planted 300 to 400 acres of field corn in a day (Muggeridge, 1997).

**References**

Brassard, D.W. 2002. BEAD Review of Korpalski Handler Exposure Assessment for Lindane Use as a Seed Treatment in the U.S. Internal Memorandum to Mark Howard dated May 15, 2002.

Brassard, D.W. and Y. Ng. 1993. Transmittal of Corn Cluster Exposure Parameters. Internal Memorandum to Larry Dorsey (HED). 12 pp.

EPA Proprietary Data. 2001.

Korpalski, S.J. 2002. Handler Exposure Assessment for Lindane Use as a Seed Treatment in the United States. Exposure study submitted to EPA by Uniroyal Chemical Company, Bethany, CT 06524, 13 pp.

Muggeridge, J.M. 1997. Up to 400 acres a day. Farm & Country Magazine, February 1997 issue, Agricultural Publishing Company Ltd., Ottawa, Ontario, Canada.

Sandvig, R. 2001. Science Advisory Council for Exposure: Policy Number 9.1: Standard Values for Daily Acres Treated in Agriculture. HED internal document Revised: September 25, 2001.

USDA. 1997a. 1997 United States Census of Agriculture-State Data: Table 26 Grains-Corn, Sorghum, Wheat, and Other Small Grains: 1997 and 1992. USDA/NASS,

[1] Each hopper usually takes 2 bags of seed which is enough to treat 6 acres; 20 hoppers x 6 acres x 1.5 refills = 180 acres.

http://www.nass.usda.gov/census/census97/volume1/us-51/us2_25.pdf

USDA. 1997b. 1997 United States Census of Agriculture-United States Data: Table 42. Specified Crops by Acres Harvested: 1997, USDA/NASS http://www.nass.usda.gov/census/census97/volume1/us-51/us1_42.pdf

**Table 1. Farm Size Distribution of Field Corn (for grain or seed)**

| Acres Harvested per farm | Number of farms | Acres | % of farms | % of acres |
|---|---|---|---|---|
| 1 to 14 | 62,220 | 465,114 | 14.4% | 0.7% |
| 15 to 24 | 36,687 | 693,524 | 8.5% | 1.0% |
| 25 to 49 | 63,977 | 2,252,678 | 14.9% | 3.2% |
| 50 to 99 | 77,908 | 5,414,064 | 18.1% | 7.8% |
| 100 to 249 | 103,096 | 16,142,856 | 23.9% | 23.1% |
| 250 to 499 | 55,293 | 18,895,093 | 12.8% | 27.1% |
| 500 to 999 | 24,995 | 16,372,841 | 5.8% | 23.5% |
| 1,000 to 1,999 | 5,673 | 7,165,024 | 1.3% | 10.3% |
| 2,000 to 2,999 | 633 | 1,458,638 | 0.15% | 2.1% |
| 3,000 to 4,999 | 195 | 685,792 | 0.05% | 1.0% |
| 5,000 or more | 34 | 251,092 | 0.01% | 0.4% |
| Total | 430,711 | 69,796,716 | 100.0% | 100.0% |

Source:

USDA. 1997b. 1997 United States Census of Agriculture-United States Data: Table 42. Specified Crops by Acres Harvested: 1997, USDA/NASS http://www.nass.usda.gov/census/census97/volume1/us-51/us1_42.pdf